AMENDMENTS TO THE DRAWINGS

As requested, descriptive labels are added to Figures 2, 9 and 10 with regard to elements that are shown schematically not pictorially.

Attachment: Replacement Sheet(s)

REMARKS/ARGUMENTS

In response to the Office Action mailed April 19, 2005, Applicants amend their application and request reconsideration. In this Amendment no claims are added or cancelled so that claims 1-8 remain pending.

The Examiner requested a more descriptive title. This request is respectively traversed. Upon review of the patent application and the subject matter claimed, the present title is sufficiently descriptive. A review of the titles of the publications cited in the Office Action likewise suggests that the title of the patent application is sufficiently descriptive.

The Examiner requested that "black boxes" in Figures 1, 2, 9, and 10 be labeled. A review of those figures indicate that Figures 2, 9, and 10 include elements shown schematically and pictorially. No elements of Figure 1 appear to be shown schematically, all elements in that figure appear to be shown pictorially. While it appears no figure requires further labeling, in order to advance the prosecution, replacement Figures 2, 9, and 10 are attached to this Amendment.

Claim 8 was rejected as indefinite for failing to describe in detail the subject matter claimed. Claim 8 has been amended to improve its clarity. That claim is supported by the description in the patent application regarding Embodiment 4, beginning at page 21 of the patent application. Figure 8 is a flow chart providing further understanding of the subject matter of claim 8. The amendment of claim 8 overcomes the rejection as to form and clarity. Claim 8 was otherwise indicated to be allowable. Therefore, further comment on that claim is unnecessary and not provided.

Although not rejected as to form, claim 4 is amended non-substantively, for clarity. The clarified claim is clearly supported in the patent application by the description concerning embodiment 2 and Figure 6.

Claims 2, 5, and 7 were indicated to be allowable if rewritten in independent form. Therefore, no further comment on those claims is necessary.

Claims 1, 4, and 6 were rejected as anticipated by Jamieson et al. (U.S. Patent 5,824,976, hereinafter Jamieson). This rejection is respectfully traversed.

Claim 1, like all of the pending claims, is directed to an elevator vibration reducing device. In this apparatus, a vibration sensor detects a horizontal vibrations of an elevator cage so that the detected vibrations can be used to control an actuator. The actuator displaces the cage horizontally to counteract the horizontal vibrations. The actuator is controlled by a control portion including a computer that computes and produces a vibration reduction control signal, based on the vibration detected by the vibration sensor. An important feature of the invention is that the control portions compares a detection value obtained from the vibration detection signal that is produced by the vibration sensor to an established value.

The control portion stops the controlling of the actuator, i.e., counteracting of the horizontal vibrations of the elevator cage, if the detection value becomes larger than the established value, indicating a fault in the vibration reducing device.

Jamieson does not disclose important features of the invention as described by claim 1. Jamieson describes a complex vibration sensor that must detect a magnetic flux in a gap and a current flowing through a coil related to the magnetic flux. Abnormalities in system operation are detected in Jamieson based upon the complex relationship between the gap, magnetic flux, and the interrelationship of the magnetic flux, current, and the gap size. The present invention is not limited to such a complex sensor and, in fact, can use a vibration sensor of any form.

In an elevator system using the vibration control of the present invention or Jamieson, control of the vibration can become impossible if an instability occurs due to changes in the characteristics of the object having vibrations controlled. In the invention and Jamieson that object is an elevator cage. When such an instability occurs, large high frequency vibrations are produced in the elevator cage as the attempt to control vibrations becomes unstable. Jamieson ignores these high frequency vibrations by filtering them out at step 43 in the flow chart of his Figure 4. In the invention, upon the occurrence of such an instability, the vibration control is stopped because the detection value exceeds the established value as described in the final paragraph of claim 1. The simplicity of control achieved in the invention defined by claim 1 is not suggested or described in Jamieson so that claim 1 cannot be anticipated by Jamieson.

The elevator vibration reducing device according to claim 4 includes, like the devices of the other claims, a vibration sensor that detects horizontal vibrations of an elevator cage and an actuator for displacing the cage horizontally. Further, a controller, based upon vibrations detected by the vibration sensor, generates a control signal for controlling the actuator to counteract those horizontal vibrations. That controller has a particular structure, described in the patent application with regard to Embodiment 2 and Figure 6. In that embodiment, a signal from the vibration sensor, sometimes characterized as an acceleration sensor, is electrically filtered to provide component signals in respective frequency ranges. This specific embodiment described in the patent application includes three such filters producing three respective vibration detection signals corresponding to the respective frequency bands.

In the device according to claim 4, each of these component signals is compared to a respective set value to determine whether to operate the actuator. Control, i.e., operation, of the actuator is stopped whenever any of the component detection signals becomes at least as large as the corresponding threshold value.

No description is present in Jamieson with regard to dividing sensed signals into components representing portions of the sensed signal in respective frequency ranges. There is no allegation in the Office Action that such a disclosure is present in Jamieson. Therefore, the rejection of claim 4 as anticipated is erroneous and, upon reconsideration, should be withdrawn.

The elevator vibration reducing device according to claim 6 includes a plurality of vibration sensors that each detect, essentially, the same vibration. As described in the first paragraph of that claim, which has been clarified, each of the vibration sensors detects the vibration of the elevator cage along a single identical horizontal direction. Thus, each of the vibration sensors should sense the same vibration and generate the same vibration detection signal, subject to normal variations in the characteristics between respective sensors and noise. As expressly stated in the final paragraph of claim 6, the vibration reducing device includes a multiple sensor output comparing portion that detects a failure of any of the vibration sensors. The failure is detected by comparing a respective vibration detection signal generated by the vibration sensors to each other. If there is significant variations between the vibration detection signals, and the control portions stops the actuator because there is an indication that at least one of the vibration sensors has failed.

Jamieson simply fails to describe any feature corresponding to claim 6. While Jamieson does illustrate the use of two sensors, there is no suggestion that the sensors measure the same vibrations or that their outputs are compared to each other in order to detect the sensor failure. Rather, according to the discussion in column 5 of Jamieson, individual gaps of the electromagnetic sensors are compared to acceptable ranges, not to each other, to determine if a sensor has failed. Therefore, since Jamieson does not describe the important features of claim 6, it cannot anticipate that claim.

Claim 3 was rejected as anticipated by Yamazaki (JP 8-333068). This rejection is respectfully traversed.

Yamazaki was supplied in an Information Disclosure Statement along with an English language abstract. In preparing a response to the Office Action, further explanation of the content of Yamazaki was sought. The only additional English-language information found was a computer-generated translation from the website of the Japanese Patent Office. For the Examiner's assistance, a copy of that translation, somewhat difficult to understand, is attached.

Claim 3 is directed to an elevator vibration reducing device. As in the other such apparatus claimed, the device includes a vibration sensor for detecting horizontal vibration of an elevator cage. Further, an actuator displaces the cage horizontally and, as described in the patent application, is actuated to compensate for or counteract the horizontal vibrations. Further, the claimed vibration reducing device includes a controller that controls the actuator

in response to the vibrations sensed by the vibration sensor. In order to actuate the actuator in response to the detector vibrations, a power amplifier amplifies a vibration reduction control signal and supplies the signal so amplified to the actuator. However, the signal may not be directly supplied, as amplified. The controller includes a current restriction means, i.e., a current limiter, that limits the current output from the power amplifier that is supplied to the actuator. This limitation is imposed to avoid damaging the actuator by supplying a current of too large a magnitude. Further, the power amplifier includes a current comparator that prevents, i.e., stops, the output of the vibration reduction control signal to the actuator when the current output from the power amplifier to the actuator is at least equal to a threshold value. Such an apparatus is illustrated in Figure 3 of the patent application and described with respect to the flow chart of Figure 5.

In order for Yamazaki to anticipate claim 3, Yamazaki must disclose every element of that claim. There is no description in either the English language abstract of Yamazaki or the computer-generated translation of any current limiting device or function. In fact, the Office Action at page 4 does not suggest that there is such an element or function in Yamazaki. No reference is made in the Office Action to a current restricting means that limits the current output from the power amplifier. Moreover, the comparator that is present within the Yamazaki apparatus is used to detect a failure of an actuator controller, not to limit a current to avoid damage to an actuator. Because at least one of the elements of claim 3 is not disclosed by Yamazaki, the assertion that claim 3 is anticipated by Yamazaki is erroneous and should be withdrawn.

Since the foregoing amendments and remarks place the application in form for allowance, prompt issuance of a Notice of Allowance with respect to claims 1-8 are earnestly solicited. Since there has been no substantive amendment of at least claims 1-5, any new rejection of any of those claims, relying upon newly applied prior art or a different legal ground, cannot properly be a final rejection.

Respectfully submitted,

Jeffrey A. Wyand, Reg. No. 29,458
LEYDIG, VOIT & MAYER
700 Thirteenth Street, N.W., Suite 300
Washington, DC 20005-3960
(202) 737-6770 (telephone)
(202) 737-6776 (facsimile)

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